

Fatigue Behavior and Modeling of Concrete Airport Pavement

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Abstract

Concrete airport pavement under wheel load due to passing aircrafts is subjected to high amplitude and low frequency fatigue loading. Because of the subgrade the stress state at the top and bottom surfaces of the pavement is at least biaxial. When resolved in terms of principal stresses, the stresses are in the compression-tension (C-T) region of the biaxial stress space, where two principle stresses have different signs. Through the investigation of the concrete airport pavement under fatigue loading and the corresponding static loading, it is found that the fatigue information can be obtained from the corresponding static test under the term of crack length/structure compliance/structure stiffness. The fatigue failure mechanism can be explained and modeled by fracture mechanics criterion.